

User's Manual

CPCI Basic 4U, 63HP

PXI Basic 4U, 63HP



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Hartmann Elektronik is a longstanding partner of the
embedded industry and has a variety of different backplanes.
With our wide selection of backplanes and enclosure you can
build your perfect system platform

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Table of Contents

1	Applicability	1
1.1	Background Information	1
2	Safety	2
2.1	Intended Application.....	2
2.2	Safety Symbols	2
2.3	General Safety Precautions	2
2.4	Safety Instructions.....	3
2.4.1	Protection Against Electromagnetic Interference (EMI)	3
2.4.2	Electrostatic Discharge Precautions.....	3
2.4.3	Installation.....	3
2.4.4	Location	3
2.4.5	Voltage Hazards	3
2.4.6	System Overheating	3
2.4.7	Mounting Considerations	4
2.4.8	Electrical Hazards.....	4
2.4.9	Board Installation	4
3	Product Description.....	5
3.1	System Overview	5
3.1.1	CPCI Basic 4 U 63 HP	5
3.1.2	PXI Basic 4 U 63 HP.....	6
3.2	Subracks	7
3.3	Backplanes.....	7
3.3.1	CPCI Backplane.....	7
3.3.2	PXI Backplane	9
3.4	Electrical Connection and Power Supply	11
3.4.1	Power Entry Module	11
3.4.2	Grounding/Protective Earthing.....	12
3.4.3	Power Supply.....	13
3.5	Cooling	15
3.5.1	Fans	16
4	Installation.....	17
4.1	Subrack Components.....	17
4.2	Inspecting the Subrack Components	17
4.3	Protection Against Electromagnetic Interference.....	17
4.4	Preparing the Subrack	17
4.4.1	Powering the Subrack.....	18
4.4.2	Installing Boards	18
4.4.3	Installing Filler Panels.....	18
5	Service	19
5.1	Technical support and Return for Service Assistance	19
5.2	Declaration of Conformity.....	19
5.3	Scope of Delivery	20
5.4	Subrack Specifications	21

List of Figures

Figure 3-1: CPCI Basic 4 U 63 HP	5
Figure 3-2: PXI Basic 4 U 63 HP	6
Figure 3-3: PICMG 2.11 R1.0 47-pin Positronic Power Connector Pin Assignments.....	8
Figure 3-4: Backplane CPCI 3U with P47 connector (sample 6 slot).....	8
Figure 3-5: Backplane CPCI 3U with P47 connector 8 slot (front)	9
Figure 3-6: Backplane PXI 3U with P47 connector 8 slot (front).....	10
Figure 3-7 Power Entry Module.....	11
Figure 3-8: Protective Earth.....	12
Figure 3-9: AC Power Supply 3U, 250W	14
Figure 3-10: Air Flow with DC fans.....	15
Figure 4-1: AC Input	18

1 Applicability

System name	Order number
CPCI Basic 4 U 63 HP Depth 280 mm, 8 Slot, 5V	LMH0000120
CPCI Basic 4 U 63 HP Depth 280 mm, 8 Slot, 3,3V	LMH0000270
PXI Basic 4 U 63 HP Depth 280 mm, 8 Slot, 3,3V	LMH0000320

1.1 Background Information

- User Manual Hartmann cPCI Backplanes
- Technical Data Hartmann CPCI Backplanes
- User Guide Hartmann CPCI Backplanes
- IEC 60297-3-101, -102, -103
- PICMG 2.0 R3.0 CPCI Core Specification
- PICMG 2.01 R2.0 Hot Swap
- PICMG 2.09 R1.0 System Management Bus
- PICMG 2.10 R1.0 Keying
- PICMG 2.8 R1.0 PXI
- IEC 1000-4-4 Electromagnetic Compatibility, Part 4, Section 4, Electrical fast transient/burst immunity test.
- EN60950-1
- Shock:
 - MIL-STD-810F 1 January 2000 Annex C, U.S highway truck Figure 514.5C-1, vertical Shock test (Sawtooth) Figure 516.5-10
- Vibration:
 - DIN EN 61373:1999, Figure 2, Category 1, Class B
 - MIL-STD-810F 1 January 2000 Annex C, Shipboard: Figure 514.5C-15

2 Safety

2.1 Intended Application




The CPCI System Platform Basic subracks is intended as a platform for a microcomputer system based on the CPCI Standard PICMG 2.0 R3.0.

CPCI System Platform Basic subracks are not end-products, so there is no valid approval for this unit. In Order to enable stand-alone functionality, additional elements are required. An operational system is achieved only by way of appropriate CPCI boards.


The completion and final testing of the units have been carried out, or at least supervised, by qualified technicians. These instructions are directed exclusively to these qualified technicians i.e. engineers, trained and qualified electricians etc.

Make sure that the finished system complies with the safety regulations currently applicable in the country it is going to be used.

2.2 Safety Symbols

	<p>Hazardous voltage!</p> <p><i>Familiarise yourself with the danger of electrical voltages and the safety precautions before starting to work with parts that carry dangerous voltages</i></p>
	<p>Caution!</p> <p><i>This symbol indicates a condition where damage of the equipment or injury of the service personnel could occur. To reduce the risk of damage or injury, follow all steps or procedures as instructed.</i></p>
	<p>Danger of electrostatic discharge!</p> <p><i>Static electricity can damage sensitive components in a system. To avoid damage, wear ESD wrist straps or at regular intervals touch blank enclosure parts.</i></p>

2.3 General Safety Precautions

	<p>Warning!</p> <p><i>Voltages over 60 VDC can be present in this equipment. This equipment is intended to be accessed, to be installed and maintained by qualified and trained service personnel only.</i></p> <p><i>This equipment is designed in accordance with protection class 1!</i></p> <p><i>It must therefore be operated only with protective GND/earth connection!</i></p>
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2.4 Safety Instructions

The intended audience of this User's Manual is system Integrators and hardware/software engineers.

The product has been designed to meet relevant standard industrial safety requirements. It must not be used except in its specific area of office telecommunication industry and industrial control. It shall not be used in safety-critical applications, life-sustaining appliances or in aircraft.

Only trained personnel or persons qualified in electronics or electrical engineering are authorized to install, operate or maintain the product.

This section provides safety information about:

- Protection Against Electromagnetic Interference (EMI)
- Electrostatic Discharge Precautions
- System Installation

2.4.1 Protection Against Electromagnetic Interference (EMI)



The product has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules, EN 55022 Class A.

To ensure proper EMC shielding, operate the subrack only with all free slots populated with filler panels.

Ensure that all EMI gaskets make correct contact.

2.4.2 Electrostatic Discharge Precautions



Electronic components can easily be destroyed by electrostatic discharge which can occur between subrack components and a person.

- Before working on the rack make sure that you are working in an ESD-safe environment.

2.4.3 Installation

To avoid subrack damage verify that the system environment meets the environmental and power requirements given in this guide before installation consider these guidelines:

2.4.4 Location

Locate the system in a stable area free of excessive movement and jarring, dust, smoke, and electrostatic discharge (ESD). Make sure that the temperature does not exceed the operating temperature given in the environmental requirements in this guide and allow room for proper air flow for cooling.

2.4.5 Voltage Hazards



The system is powered with a power supply the mains voltage is 115/230VAC. (Voltage range 85VAC to 265VAC)

This voltage is considered hazardous.

2.4.6 System Overheating

The boards are cooled by fans (bottom to top).

Ensure that other equipment below or on top of the subrack do not obstruct the airflow through the systems.

The subrack ambient temperature may not exceed 40 °C.

2.4.7 Mounting Considerations

During the course of handling, shipping, and assembly, parts could become loose or damaged.

Do not operate a shelf in this condition, as this may cause damage to other equipment.

2.4.8 Electrical Hazards

The caution label on the system's rear near the grounding studs shows that you have to create an earth connection because there may be a high leakage current which is considered hazardous.



High leakage current can cause injuries.

Ensure that the system is properly grounded at all times, the following conditions shall be met:

- This equipment shall be connected directly to the AC supply system earthing

2.4.9 Board Installation

Electrostatic discharge and incorrect board installation or removal can damage circuits or shorten their life.

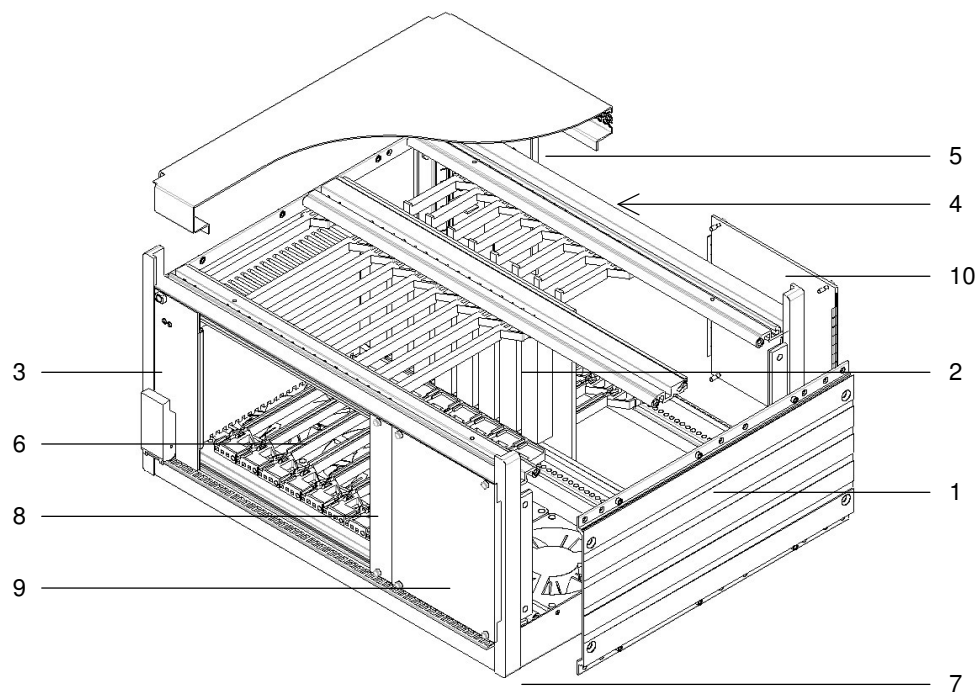


- Before touching the boards, rear transition module or electronic components, make sure that you are working in an ESD-safe environment
- Boards should be inserted and removed using their handles, do not force the board by applying pressure to the front panel.

3 Product Description

3.1 System Overview

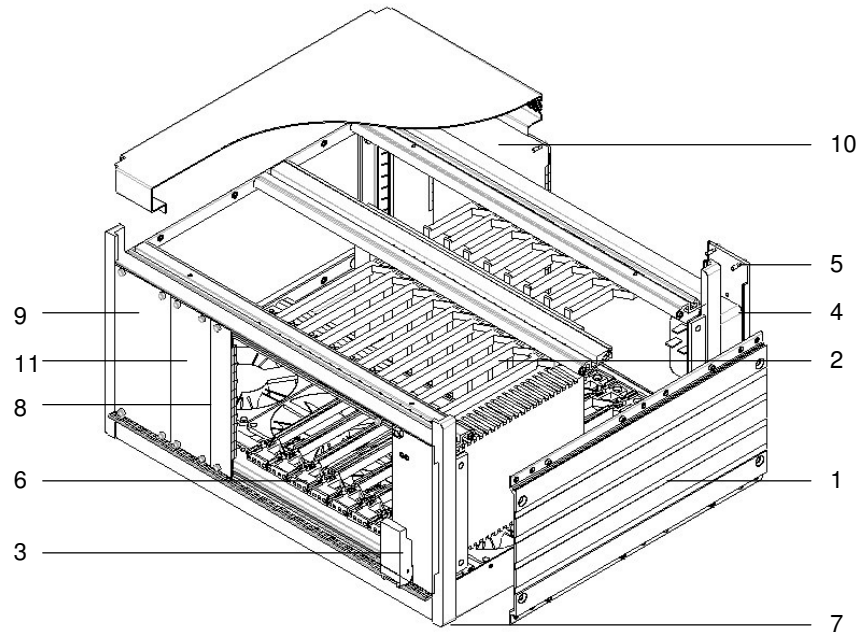
3.1.1 CPCI Basic 4 U 63 HP



1	Desk-top enclosure 4U, 63HP, profile / side wall made of chromated aluminum. Cover / bottom plate black coated outside [RAL9005], inside chromated, bottom plate perforated. with IEEE guide rails and ESD clip mounted at the bottom.	2	CompactPCI backplane: 3 U, 8 slots, 32-bit / 33 MHz, system slot on right side, with rear I/O, with P47 connector
3	CompactPCI power supply unit 250 W with wide range input 90 – 264 VAC (3.3 V / 33 A, 5 V / 33 A, 12 V / 5.5 A, –12 V / 1 A) with PFC, with P47 connector, incl. front panel 3 U / 8 HP	4	Power entry module with switch, fuse and filter
5	Partial rear panel 8 HP / 3 U with EMC gasket and cutout for power entry module, with EMC gasket	6	4 x DC fans: 80 x 80 x 15 mm, 29.9 CFM, 33.4 dB(A)
7	2 x Front feet with positioner	8	Partial front panel 4 HP / 3 U, with EMC gasket
9	Partial front panel 19 HP / 3 U, with EMC gasket	10	Partial rear panel 23 HP / 3 U, with EMC gasket

Figure 3-1: CPCI Basic 4 U 63 HP

3.1.2 PXI Basic 4 U 63 HP



1	Desk-top enclosure 4U, 63HP, profile / side wall made of chromated aluminum. Cover / bottom plate black coated outside [RAL9005], inside chromated, bottom plate perforated. with IEEE guide rails and ESD clip mounted at the bottom.	2	PXI backplane: 3 U, 8 slots, 3.3 V, 32-bit / 33 MHz, system slot right, with rear I/O, with P47 connector
3	CompactPCI power supply unit 250 W with wide range input 90 – 264 VAC (3.3 V / 33 A, 5 V / 33 A, 12 V / 5.5 A, –12 V / 1 A) with PFC, with P47 connector, incl. front panel 3 U / 8 HP	4	Power entry module with switch, fuse and filter
5	Partial rear panel 8 HP / 3 U with EMC gasket and cutout for power entry module, with EMC gasket	6	4 x DC fans: 80 x 80 x 15 mm, 29.9 CFM, 33.4 dB(A)
7	2 x Front feet with positioner	8	Partial front panel 4 HP / 3 U, with EMC gasket
9	Partial front panel 11 HP / 3 U, with EMC gasket	10	Partial rear panel 23 HP / 3 U, with EMC gasket
11	Partial front panel 8 HP / 3 U, with EMC gasket		

Figure 3-2: PXI Basic 4 U 63 HP

3.2 Subracks

Desk-top enclosure, profile and side wall made of chromated aluminum. Cover and bottom plate black coated outside [RAL9005], inside chromated, bottom plate perforated. Card rack with IEEE guide rails and ESD clip mounted at the bottom.

3.3 Backplanes

3.3.1 CPCI Backplane

General and technical information

The CompactPCI bus is compatible with the PCI bus known from the PC world as far as the electrical specifications are concerned.

The mechanical specifications were adapted to the commonly used Euro-board plug-in system in the 19" card rack. Therefore this bus is also suitable for industrial purposes. Previously unattained signal speeds supported by the layout technology developed by Hartmann Elektronik guarantee more stability and reliability for assemblies operating in the limit range.

The backplanes manufactured by Hartmann Elektronik are distinguished by a completely novel energy buffering feature which works across the entire frequency range.

This feature guarantees improved reliability thanks to more stable supply voltages directly at the slot in conjunction with fluctuating loads.

Chassis GND connection

A continuous electrically conductive chassis GND surface is located in the area where the bus board is mounted on the card rack. An M3 screw connection is available to connect the chassis ground. By installing a connecting bracket or terminal bar, the chassis GND can be connected to GND in a low-resistance star arrangement.

JTAG connector

A separate 6-pin connector for JTAG boundary scan is implemented on the backplane.

Faster, simpler system initialization and testing by means of the JTAG bus even in the completely mounted state are achieved by direct access via an additional connector on the backplane.

IPMB connector

A separate 5-pin connector for IPMB extension is implemented on the backplane.

Utility connector

The special signals to the power supply unit and external LEDs are routed to separate plug-in connectors on the backplanes. Depending on the backplane type, either a 10-pin or a 14-pin connector is used.

47-pin Positronic Power Connector

The 47-pin Positronic Power Connector regarding PICMG 2.11 R1.0 is integrated in this backplane variant.

Between the power supply unit and the Backplane no further wiring is required.

Pin	Signal	Pin	Signal	Pin	Signal
1	V1			2	V1
3	V1			4	V1
5	RTN			6	RTN
7	RTN			8	RTN
9	RTN			10	RTN
11	RTN			12	RTN
13	V2			14	V2
15	V2			16	V2
17	V2			18	V2
19	RTN			20	V3
21	V4	22	RTN	23	Reserved
24	RTN	25	GA0	26	Reserved
27	EN-	28	GA1	29	V1ADJ
30	V1 Sense	31	GA2	32	V2ADJ
33	V2 Sense	34	S RTN	35	V1 Share
36	V3 Sense	37	IPMB_SCL	38	DEG-
39	INH-	40	IPMB_SDA	41	V2 Share
42	FAL-	43	IPMB_PWR	44	V3 Share
				45	CGND
46	ACN/+DC IN				
				47	ACL/-DC IN

V1 (typically 5 V)
V2 (typically 3.3 V)

V3 (typically +12 V)
V4 (typically -12 V)

RTN (GND)

Figure 3-3: PICMG 2.11 R1.0 47-pin Positronic Power Connector Pin Assignments

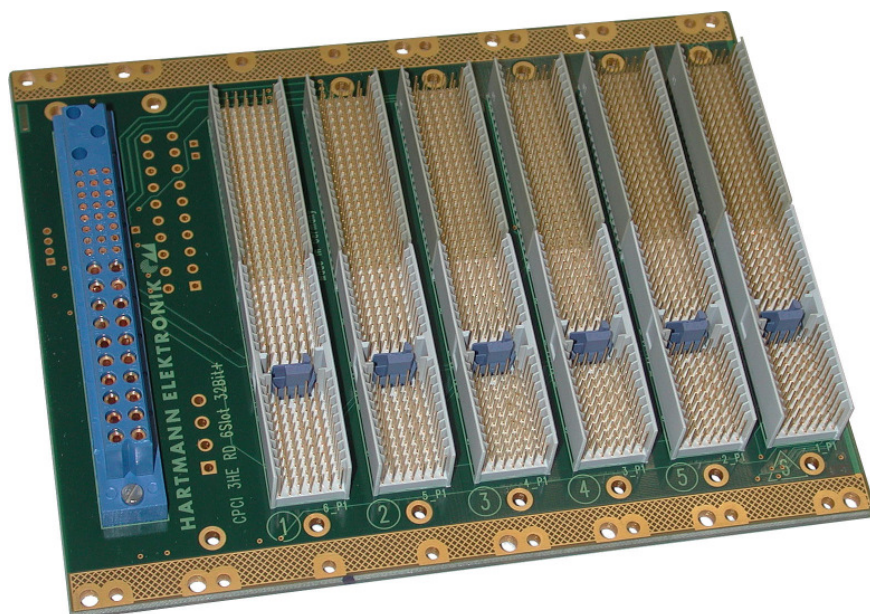


Figure 3-4: Backplane CPCI 3U with P47 connector (sample 6 slot)

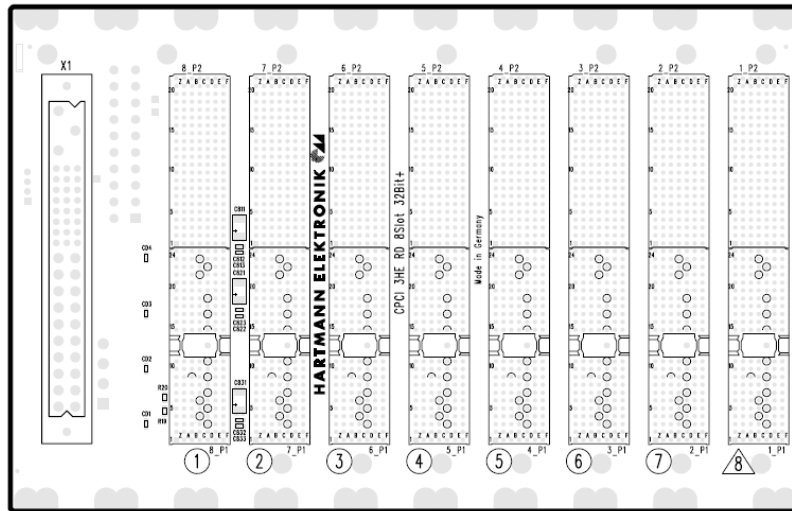


Figure 3-5: Backplane CPCI 3U with P47 connector 8 slot (front)

3.3.2 PXI Backplane

General and technical Information

PICMG 2.8 defines a pin-out of the J2 connector for use in instrumentation systems based on CompactPCI.

The defined pins would be used to allow multiple modules to synchronize and precisely time the execution of their operations.

The instrumentation specification would use the allowance by the core CompactPCI specification for implementing other functions on J2 (rear panel I/O definition of J2 with subbuses).

Specifications include:

- 3 U/6 U
- 33 MHz/66 MHz
- 32-bit/64-bit
- 2 to 14 slots
- with/without Rear I/O
- Backplanes with more than 8 slots come with a PCI to PCI bridge.

This design has a slot pitch of 4 units to implement a backplane with the most compact dimensions possible in 19" card racks.

Features of the used PXI backplane:

- 8 slot with rear I/O
- 32-bit / 33MHz
- V(I/O) = 3.3 V
- The V(I/O) voltage can be changed in a simple manner with this variant
- Power is supplied via a 47P power connector
- Screw connections and terminal bars for all voltages are additionally available
- Connectors for external connection of the JTAG bus and IPMB bus are also assembled

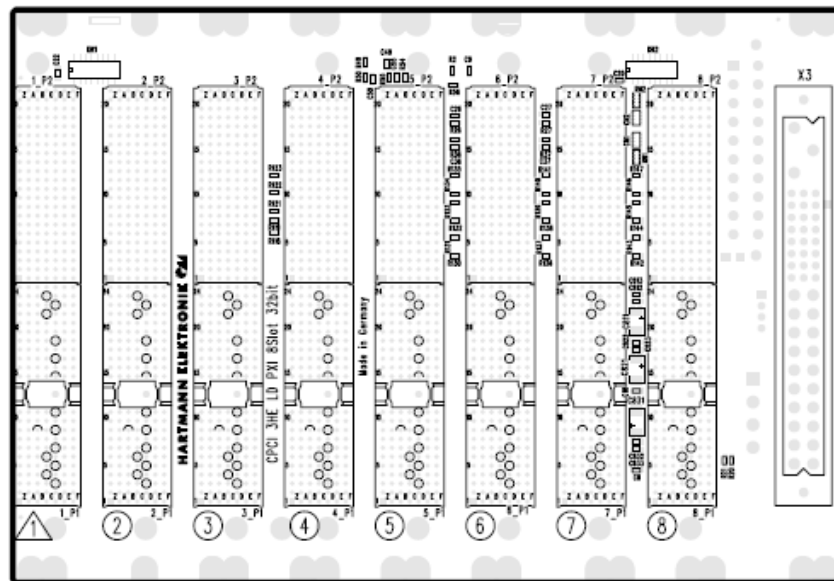


Figure 3-6: Backplane PXI 3U with P47 connector 8 slot (front)

3.4 Electrical Connection and Power Supply

3.4.1 Power Entry Module

The power input module is provided with an IEC 320-C14 connector, integrated Filter, fuseholder 1-pole and Line Switch 2-pole.

Technical Data

Ratings IEC	1 - 10 A @ Ta 40 °C / 250 VAC; 50 Hz
Ratings UL/CSA	1 - 8 A @ Ta 40 °C / 250 VAC; 60 Hz
Leakage Current	standard < 0.5 mA (250 V / 60 Hz)
Dielectric Strength	>1.7 kVDC between L-N >2.7 kVDC between L/N-PE Test voltage (1 min/50 Hz)
Allowable Operation Temp	-25 °C to 85 °C
Climatic Category	25/085/21 acc. to IEC 60068-1
Degree of Protection	from front side IP 40 acc. to IEC 60529
Protection Class	Suitable for appliances with protection Class 1 acc. to IEC 61140
Terminal	Quick connect terminals 6.3 x 0.8 mm
Panel Thickness s	Screw-on mounting, max 8 mm
Material Housing	Thermoplastic, black, UL 94V-0
Appliance-Inlet/-Outlet	C14 acc. to IEC/EN 60320-1 UL 498, CSA C22.2 no. 42 (for cold conditions) pin-temperature 70 °C, 10 A, Protection Class 1
Fuseholder	1 pole, Shocksafe category PC2 acc. to IEC 60127-6, for fuse-links 5 x 20 mm
Rated Power Acceptance @ Ta 23 °C	5 x 20 2 W (1 pole)/ 1.6 W (2-pole) per pole
Power Acceptance @ Ta > 23 °C	Admissible power acceptance at higher ambient temperature see derating curves
Line Switch	Rocker switch 2-pole, non-illuminated, acc. to IEC 61058-1
Line Filter	Standard and Medical Version, IEC 60939, IEC 60601 □1, UL 1283, UL 544, EN 133 200, CSA C22.2 no. 8
MTBF	> 2'000'000 h acc. to MIL-HB-217 F

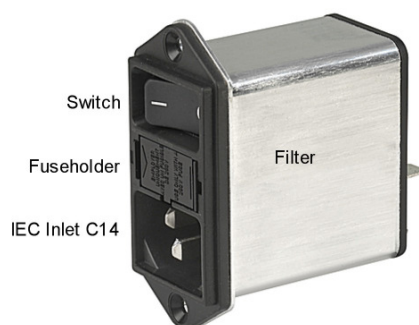



Figure 3-7 Power Entry Module

Subrack systems LMH0000120, LMH0000270 and LMH0000320 are delivered with fuse: 5x20mm 250V/6,3A T m. UL/CSA:

	<p>Caution!</p> <p>The fuse values (6,3A T, 10A T) are only for incoming inspection.</p> <p>The final values depends on the ready configuration of the completed system, e.g. number of power supplies.</p>
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3.4.2 Grounding/Protective Earthing

The system contains gaskets at the subrack and board level to guard against electromagnetic interference (EMI). Each of the subrack's individual components make contact with the gaskets and to the PE-stud inside the rear panel..

The guide rails are also fitted with electrostatic discharge (ESD) contacts for each blade and RTM. These ESD contacts ensure that the boards are fully discharged to prevent static caused by static as they are plugged into the subrack.


	<p>Caution!</p> <p><i>The subrack is designed in accordance with protection class 1!! It must therefore be operated with protective earth/GND connection. Use only a three conductor AC power cable with a protective earth conductor that meets the IEC safety standards!</i></p>
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Figure 3-8: Protective Earth

3.4.3 Power Supply

The power supply has the following main features:

- 250W 3U x 8HP
- Meet IEC 61000-3-2 harmonic correction
- Internal OR-ing diodes for N+1 redundancy
- Hot - swappable
- Third-wire current sharing
- EMI meet EN 55022 / FCC class A
- CE marking compliance
- Fully compliant with PICMG

Technical data

INPUT SPECIFICATION	
Input Voltage	Typ. 90-264Vac.
Power Factor Correction	Meet Harmonic Correction IEC 61000-3-2. Power Factor typ. 0.95-0.97.
Input Connector	Positronic 47-pin PCIH47M400A1.
Input Frequency	47-63Hz.
Inrush Current	Less than 30A @ 230Vac.
Input Current	2.8A @115Vac/1.4A @230Vac.
Dielectric Withstand	Meet IEC 60950-1 regulation.
EMI	Meet EN 55022 / FCC Class A.
Hold-up Time	5mS after power fail signal.
Earth Leakage	Less than 0.5mA @230Vac.
Remote ON/OFF	Available at [INH#] & [EN#] pins.
Power Fail Signal	Available at [FAL#] pin.
Status LED	<Green> means valid input voltage. <Amber> means a critical fault.
Thermal Protection (OTP)	Installed NTC and thermostat for thermal sensor at [DEG#] pin.
OUTPUT SPECIFICATION	
Output Voltage	+5V; +3.3V; +12V; -12V
Output Current	+5V: 33.0A; +3.3V: 33A; +12V: 6A; -12V: 1.5A
Output Wattage	Typ. 250W continuous.
Output Connector	Positronic 47-pin PCIH47M400A1.
Line Regulation	Typ. 0.1%.
Load Regulation	Typ. ±1-2%.
Noise & Ripple	Typ. 1% peak to peak or 50mV, whichever is greater.
OVP	Built-in at all outputs.
Adjustability	Available at VO1,2 & 3.
Output Trim	Electrical trim available at VO1/VO2.[ADJ #]
Remote Sensing	Available at VO1,VO2 & VO3.
Hot-Swap	Available.
N+1 Redundancy	Installed with internal OR-ing diodes at all outputs
Current Sharing	Third-wire current sharing at VO1,2 & 3.
Power OK Signal	Available for all output.
Over Current Protection (OCP)	Installed at each rail.
Overload Protection (OLP)	Fully protected against output overload or short circuit. Typical 120% max. load
GENERAL SPECIFICATION	
Efficiency	Typ. 76-77 %.
Switching Frequency	120K Hz.
Circuit Topology	Forward circuit.

Transient Response	Peak transient less than 100mV and recovers within 2mS after 25% load-change.
Safety Standard	IEC 60950-1 Class I.
Construction	Eurocard 3U X 8HP X 160mm CompactPCI format
Operating Temperature	0 to +50 °C at full load with specified air flow. Derates linearly to 50% at +70 °C.
Storage Temperature	-40 to +85 °C.
Temperature Coefficient	Typ. $\pm 0.02\%$ / °C.
Cooling	At least 20 CFM(600 LFM) moving air is required to achieve full rating power 250W in a confined area.
Power Density:	4.58 Watts/ Cubic Inch.

Output Current

+5V			+3,3V			+12V				-12V			
Min	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Pk	Min.	Typ.	Max.	Pk.
0A	25.0A	33,0A	0A	18.0A	33,0A	0A	5.0A	5,5A	6A	0A	0,5A	1A	1,5A



Figure 3-9: AC Power Supply 3U, 250W

For DC Power Supply, please ask Hartmann Elektronik.

3.5 Cooling

The operating temperature is from 0°C to 40°C.

The front boards are cooled by forced air convection through four DC axial fans 80 x 80 x 15 mm.

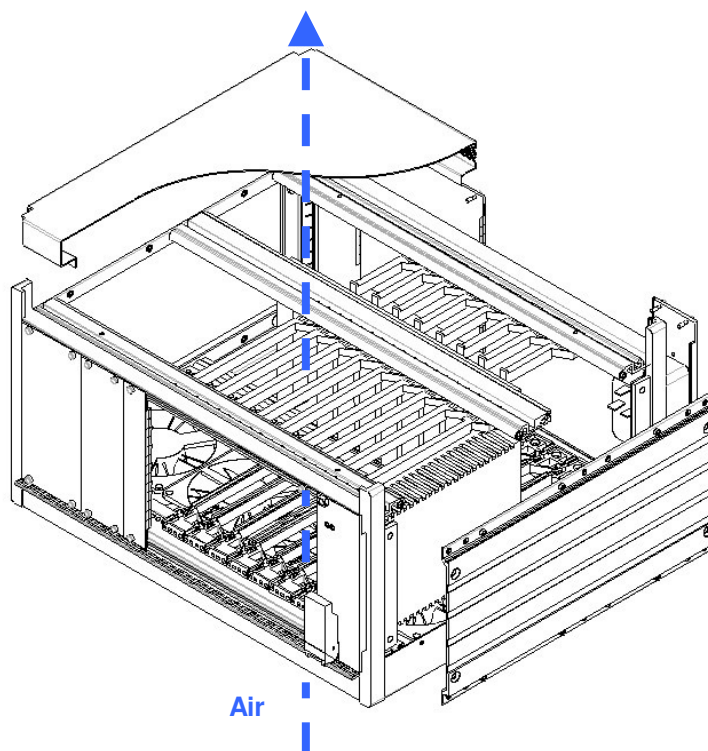


Figure 3-10: Air Flow with DC fans



Caution!

To ensure proper air flow within the system make sure that all slots are populated with either boards or filler panels.

3.5.1 Fans

General Specification

- Motor Protection: Auto Restart
- Isolation Resistance: 10M Ω or higher with a DC500V megger
- Dielectric Withstand Voltage: 1500VAC 60s
- Ambient Temperature Range: -10°C - +70°C (Operating)

Technical data DC fan 80 x 80 x 15 mm

Dimensions:	80mm x 80mm, 15mm thick
Rated Voltage:	12V
Operating Voltage	10,8 – 13,2V
Rated Current	0,180A
Rated Input:	2,16W
Rated Speed:	3200min ⁻¹
Air Flow:	29,9cfm
Static Pressure:	0,129 inch H ² O
Noise:	33,4dB(A)
Bearing	Ball Bearing
Operating Temperature	-10°C - +70°C
Storage Temperature	-40°C to +70°C
Life Expectancy	50000h at 25°C
Material	Housing: glass filled polyester (P.B.T) 94V-0 Fan Blade: glass filled polyester (P.B.T) 94V-0 Lead Wire: UL1007, AWG24; + red, -black

4 Installation

This section provides set up information and operation for the subrack:

- Subrack Components
- Inspecting the Components
- Protection Against Electromagnetic Interference
- Preparing the Subrack

4.1 Subrack Components

The subracks comes equipped with the following components:

- Desk-top enclosure, 4U, 63HP, 280mm deep
- One Power Entry module with IEC 320-C14 connector, switch, fuse and filter
- One CPCI power supply 250W AC
- Four DC fans: 80 x 80 x 15mm, 29,9 CFM, 33,4 dB(A)

CPCI Basic 4U

- One CPCI backplane compliant with PICMG 2.0 R3.0 specification.
8-slot front and 8 RTM slots with P47 connector

PXI Basic 4U

- One PXI backplane compliant with PICMG 2.0 R3.0 and PICMG 2.8 R1.0
specification
8-slot front and 8 RTM slots with P47 connector

4.2 Inspecting the Subrack Components

During the course of handling, shipping, and assembly, pins, shrouds, mounting screws, fans and other items can become damaged and/or loose.



WARNING: Before utilizing the subrack, perform a thorough inspection to ensure the subrack and its components are not damaged.

- To inspect the subrack:
 1. Visually inspect the subrack to ensure that all of the connector pins are straight, screws are tight, and so on.
 2. Check to ensure none of the EMI gaskets are damaged.

4.3 Protection Against Electromagnetic Interference

The subrack contains gaskets at the shelf and board level to guard against electromagnetic interference (EMI). Ensure that the subrack is grounded and that each of the subrack individual components make contact with the gaskets.

Follow the proper grounding and ESD handling procedures.

4.4 Preparing the Subrack

In preparing the subrack perform the following:

- Powering the Subrack
- Installing Boards
- Installing Filler Panels

4.4.1 Powering the Subrack

Before inserting boards, power the subrack to ensure that it is operating properly. The power connections and the mains switch are located at the rear of the shelf

- Ensure that the AC switch is set to the off (O) position.
- Connect the mains AC cable (C14, 10 Amp, not supplied) to the AC inlet.
- Turn the AC switch to the on (I) position.

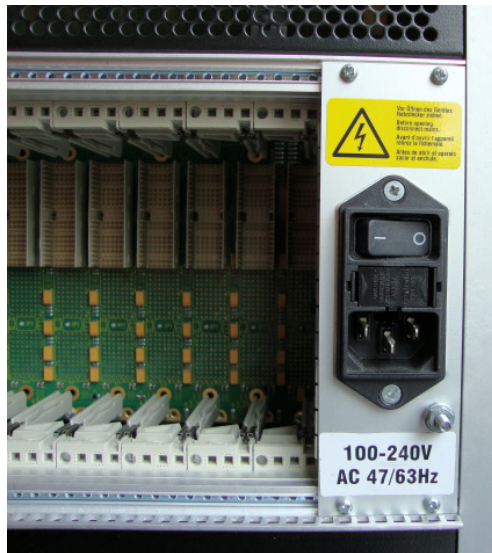


Figure 4-1: AC Input

4.4.2 Installing Boards

The CPCI Basic 4U shelf is compliant with CPCI Standard PICMG 2.0 R3.0 and accepts boards that are compliant with the CPCI Standard PICMG 2.0 R3.0

The PXI Basic 4U shelf is compliant with CPCI Standard PICMG 2.8 R1.0 and accepts boards that are compliant with the: CPCI Standard PICMG 2.8 R1.0



WARNING: Boards should slide easily when installing or removing them from the shelf. Forcing the boards may cause damage to the interface connector pins.

4.4.3 Installing Filler Panels

Filler panels consists of a front panel (with or w/o air baffles), EMC gasket and mounting screws.



WARNING: Close all empty subrack slots with filler panels. The filler panel prevents fan air from escaping out open slots.

5 Service

5.1 Technical support and Return for Service Assistance

Please return the complete subrack system. For all product returns and support issues, please contact your Hartmann sales distributor or www.hartmann-elektronik.de

Please use the original packing material. Shipping without the original packing material might void the warranty.

5.2 Declaration of Conformity

The HARTMANN CPCI / PXI systems platform Basic subracks are developed and manufactured according to EN 60950-1.

The HARTMANN CPCI / PXI systems platform Basic subracks are not end-products with independent functionality according the EMC regulations, therefore CE marking is not required. Not before CPCI boards are plugged into the subrack, the systems fulfill the requirements in accordance with EMC Directive 2004/108/EG and Low-voltage Directive 2006/95/EG.

With the EMC optimized enclosure design and the high quality power input filters for the mains connection offers HARTMANN CPCI / PXI systems serve an ideal base for system Integrators, which comply with the limits of EN 6100-6-3 and EN 61000-6-2

A functionality test and protective earth test is carried out on each system.

The included power supplies are in accordance with EN 60950-1, EN 55022 / FCC Class A IEC 61000-3-2 HARMONIC.

5.3 Scope of Delivery

Subrack	Quantity	Description
	1	Desk-top enclosure, profile and side wall made of chromated aluminum. Cover and bottom plate black coated outside [RAL9005], inside chromated, bottom plate perforated. Card rack with IEEE guide rails and ESD clip mounted at the bottom.
	1	Power Entry module with IEC 320-C14 connector, switch, fuse and filter
	1	CompactPCI power supply unit 250 W with wide range input 90 – 264 VAC (3.3 V / 33 A, 5 V / 33 A, 12 V / 5.5 A, –12 V / 1 A) with PFC, with P47 connector, incl. 3U / 8HP front panel
	4	DC fans: 80 x 80 x 15 mm
	1	AC/DC cabling
CPCI Basic 4U	1	CompactPCI backplane: 3 U, 8 slots, 32-bit / 33 MHz, system slot on right side, with rear I/O, with P47 connector
	1	Partial front panel 8 HP / 3 U with EMC gasket and cutout for power entry module, with EMC gasket
	1	Partial front panel 4HP 3U with EMC gaskets
	1	Partial front panel 19HP, 3U with EMC gasket
	1	Partial front panel 23HP 3U with EMC gaskets
PXI Basic 4U	1	PXI backplane: 3 U, 8 slots, 3.3 V, 32-bit / 33 MHz, system slot on right side, with rear I/O, with P47 connector
	1	Partial front panel 8 HP / 3 U with EMC gasket and cutout for power entry module, with EMC gasket
	1	Partial front panel 4HP 3U with EMC gaskets
	1	Partial front panel 8HP 3U with EMC gaskets
	1	Partial front panel 4HP 3U with EMC gaskets
	1	Partial front panel 23HP 3U with EMC gaskets

5.4 Subrack Specifications

Dimensions	Height	190,7mm
	Width	341,4mm
	Depth (front card cage)	for Boards: 160mm
	Depth (subrack)	280,6mm
Weight		4,7kg
AC Power Supply	Input	90 – 264 VAC
	Frequency	47 – 63 Hz
	Output Power	250 W
DC Power Supply	optional	
Cooling		4 x DC fans: 80 x 80 x 15 mm, 29,9 CFM,
Temperature:	Operating	0 °C to +40 °C
	Storage	-20 °C to +70 °C
	Transport	-20 °C to +70 °C
Humidity:	Operating	5% to 80% non-condensing
	Storage	5% to 80% non-condensing
	Transport	5% to 80% non condensing
Shock		MIL-STD-810F 1 Jan 2000 Annex C, U.S highway truck Figure 514.5C-1, vertical Shock test (Sawtooth) Figure 516.5-10
Vibration:		DIN EN 61373:1999, Figure 2, Category 1, Class B MIL-STD-810F 1 Jan 2000 Annex C, Shipboard: Figure 514.5C-15
EMC	Emissions	EN 61000-6-3
	Immunity	EN 61000-6-1
Safety		Test voltages according to EN 60950-1
Electromagnetic Shielding		Typ.40 dB at 1 GHz (with front panels)
Regulatory Compliance:		EN60950-1